

# SUGGESTIONS

FOR

## A CRYSTAL COLLEGE

OR

## NEW PALACE OF GLASS,

FOR COMBINING

THE INTELLECTUAL TALENT OF ALL NATIONS;

OR,

## A SKETCH

OF A

## PRACTICAL PHILOSOPHY OF EDUCATION.

BY W. CAVE THOMAS,

*Master of the North London School for Drawing and Modelling.*

"I seize this, as I shall every other opportunity, to advocate that system of education which regards the training of all the faculties."—*Address to the Students of the North London School, May 1850.*

LONDON:

DICKINSON BROTHERS, 114, NEW BOND STREET,

AND

MARCHANT SINGER & CO., 1, INGRAM COURT, FENCHURCH STREET.



26.11.67.

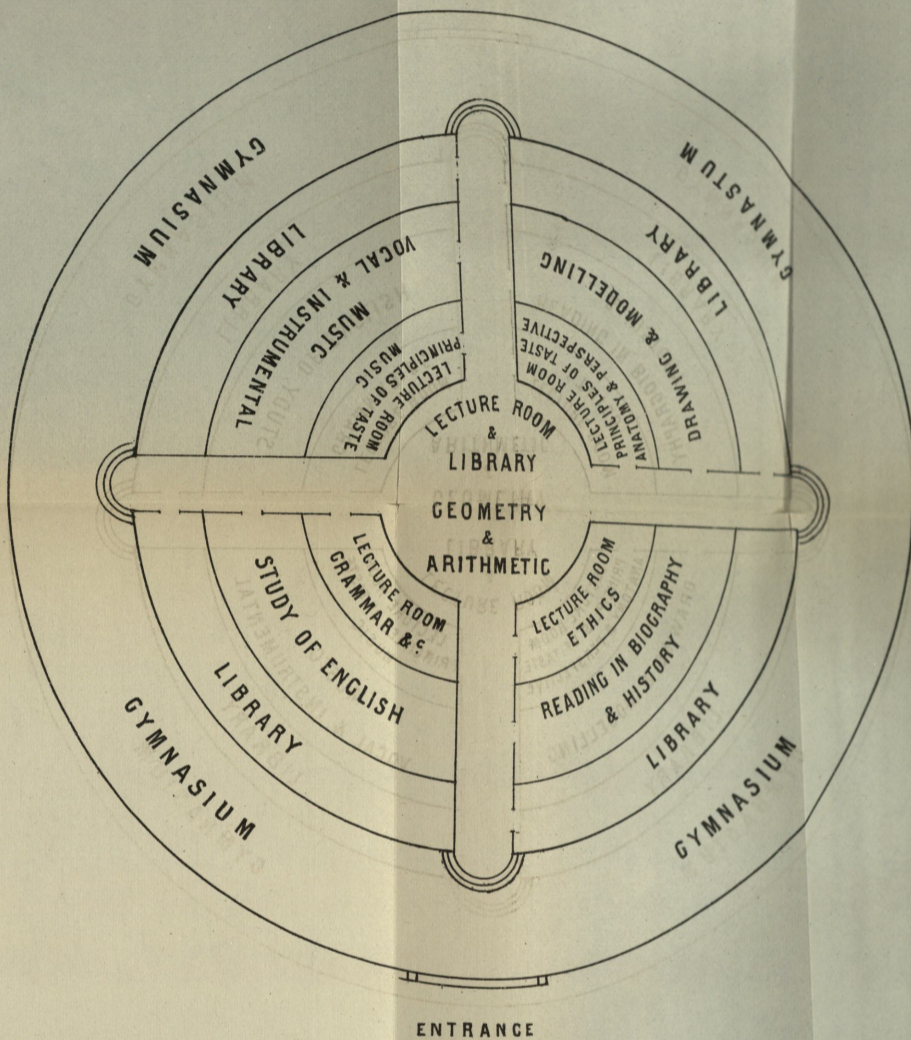
THE INTELLECTUAL TREASURY OF ALL NATIONS  
NEW PALACE OF GLASS  
CRYSTAL COLLEGE  
SUGGESTIONS

AN  
ARTICLE  
IN THE  
PHILOSOPHY OF INNOVATION

BY W. CLAY THOMAS

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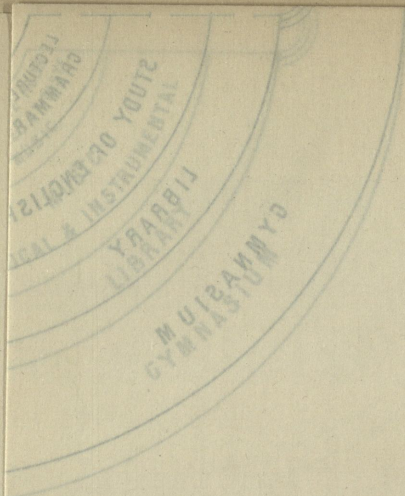
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RELATIVE ARRANGMENT OF ELEMENTARY  
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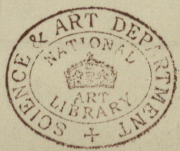
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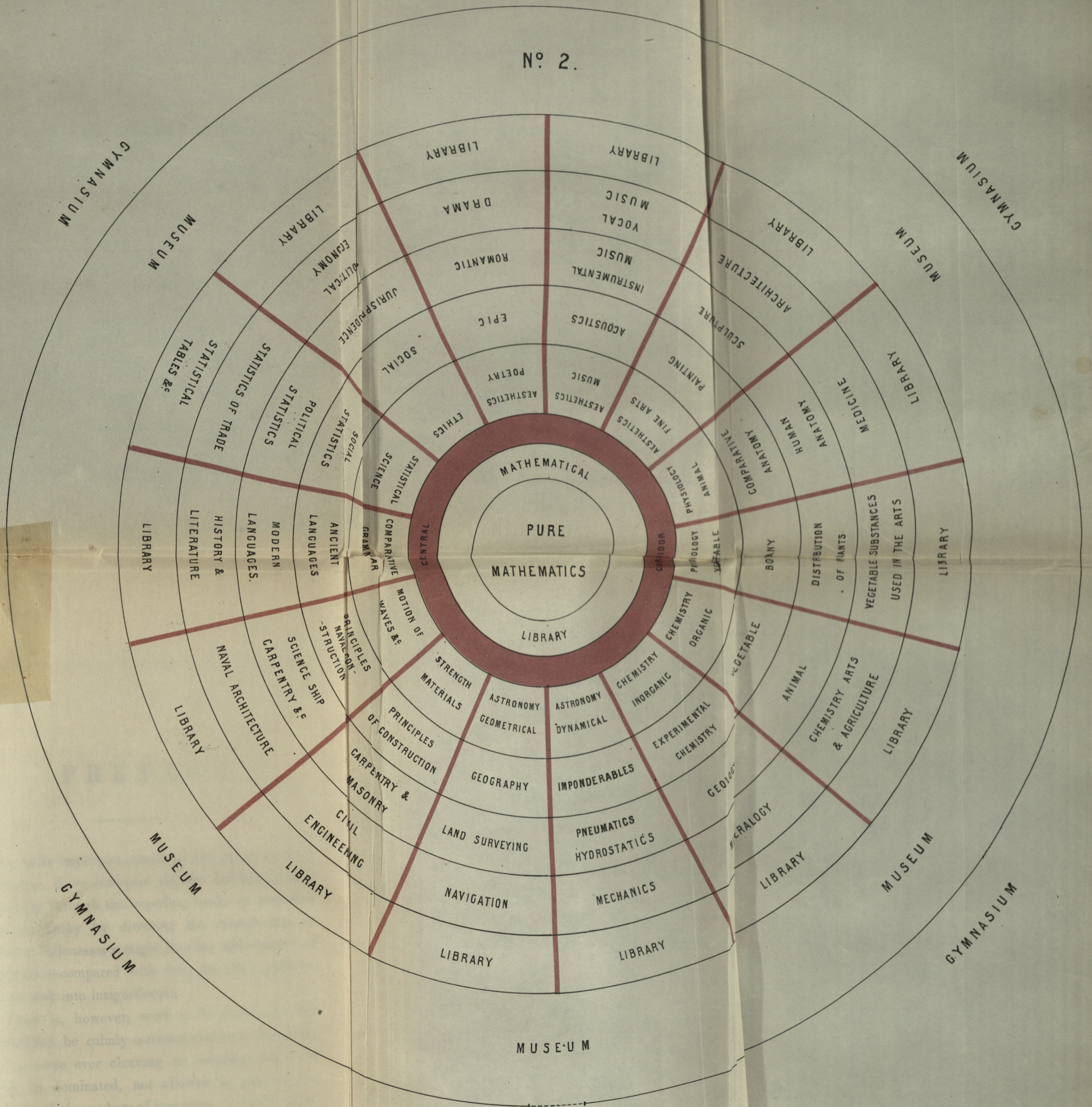


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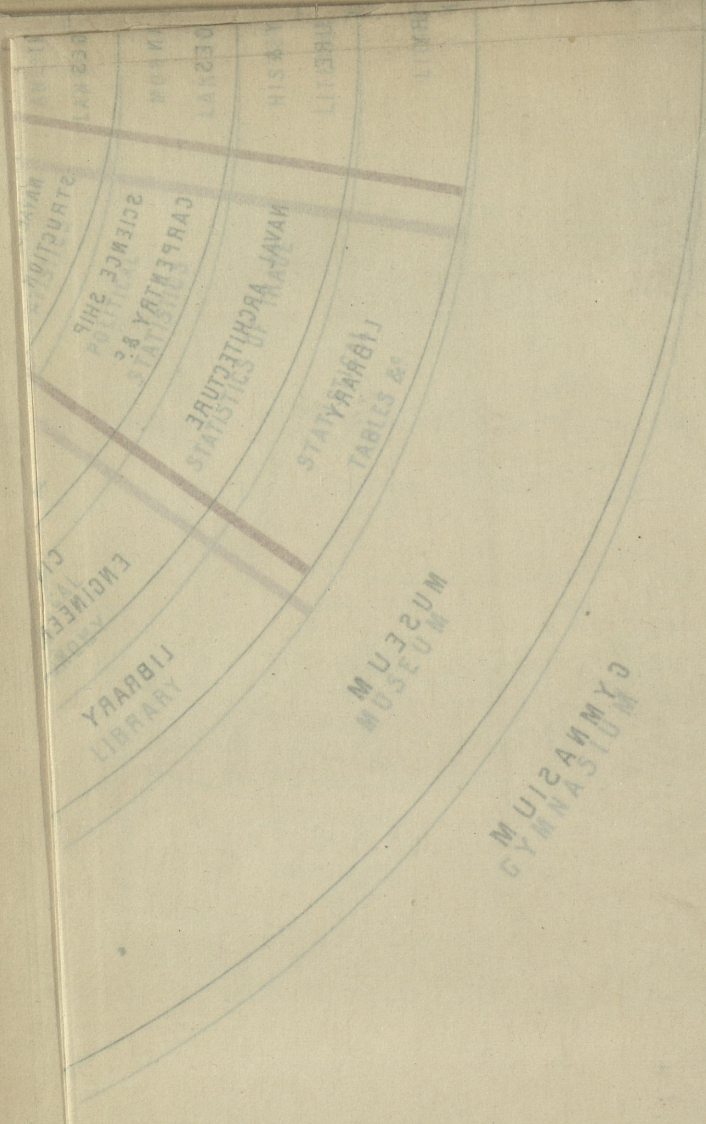


PRINCIPAL ENTRANCE

RELATIVE ARRANGEMENT OF LECTURE ROOMS  
OF A CENTRAL COLLEGE.

W. CAVE THOMAS.

THE RED SPACES ARE PASSAGES & CORRIDORS ALLOWING INDEPENDANT ACCESS TO EACH SECTION.



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ACCESS TO EACH SECTION  
CORRIDORS ALLOWING INDEPENDANT  
THE RED SPACES ARE PASSAGES &

## P R E F A C E.

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THE most important result of the great event of this year, if we interpret rightly, has been that of breaking through the impeding banks of prejudice and antipathy by directing the meanderings of ancient littlenesses straight into the mid-channel of progress,—compared with this, its other achievements sink into insignificance.

There is, however, work to be done, the tide should not be calmly contemplated from the shore,—"a curse ever cleaving to standing still,"—it must be dominated, not allowed to pass uncontrolled; there are bars of ignorance 'a-head,' which if suffered to remain, will ultimately choke its egress, and roll it back with fearful mischief.

Events of like magnitude, if not the precursors of greater, generally form the commencement of the concluding chapter of a country's history. When

the public mind has expanded to the fulness of one idea, it requires a larger, otherwise having attained to its prescribed growth, its vital energies decay.

The writer feeling the present to be a critical period, in which all earnest men should contribute their experience to deliberations in council, induces him to advance with deference his quota of information. His connection with the *North London School for Drawing and Modelling* led to considerations touching the organization of schools for diffusing taste; this ultimately conducted to the larger question of general education, and enabled him to contemplate the former from higher ground.

Not knowing what title his views may have to originality, none is claimed; his aim has been to collect such materials as were floating disconnectedly on the stream of knowledge, and endeavour to arrange them theoretically and practically. If a false philosophy be advanced, it is hoped that it may at least have the effect of provoking and eliciting truth. It has been asserted that man instinctively flies from the spectral world of ignorance; our experience, however, leads us to a contrary conclusion, viz. that he oftener tenaciously clings to it,—dreading realities,—that rather than meet these face to face he will ensconce himself on the corrupt

night side of nature, behind the drop curtain of opinion and prejudice.

The fundamental character of the scheme we are about to develop, therefore may startle those accustomed to consider education in taste as an isolated branch of study, as something which may be attained *per se* disconnected from other studies. Here they will find, on the contrary, our object to be the vindication of thorough instead of partial measures, to shew that a purer knowledge of the beautiful can only result from a more perfect system of education, in which all the faculties are proportionately developed, the Fine Arts having their due share of attention with other exercises ; also that this is not merely a question concerning the future excellence of our ornamental wares, but the greater one of the future welfare and progress of the British people.

Opinions are so diverse, opposed, and bitter concerning Religious instruction, that although conscious of its paramount importance as the spirit which should endow material knowledge with vitality, we abstain from any reference to it in the scheme now submitted to the public.

The domain of science is the only common ground on which an educational system can be discussed, or on which a catholic accord is possible at present.

It is strange, however, to find in this age of enlightenment persons still believing science to be opposed to religion, yet such there are. Is there not a material as well as spiritual revelation? Is not the Almighty manifest in nature? How then can it be irreligious to trace the symbols of his will?

The following is the order of treatment observed in the essay:—

SECTION I.—INTRODUCTION—The importance of educating taste argued on the ground of material advantages—The question considered from a higher point of view—Particular departments of art and science are more likely to be advanced by the descent of minds of generally cultivated powers, than by a limited special education—Arguments against one-sided education in general.

SECTION II.—Organization determines capacity—Capacity in the ratio of organization.

SECTION III.—External influences modify organization—The difficulty of separating the consideration of organization from that of the conditions essential to its development—The writer has no theory of progressive development in view—Organization most modifiable

in the earlier stages of existence—Responsibility of education on this account—Man metes good or evil to society according to the favorable or unfavorable nature of his education—Education the root and stem from which all reform to be permanent must branch—Organization may be either degraded or heightened—Education ought, therefore, to take advantage of this modifiability to induce an organization approximating a perfect archetype—The small proportion which intuitive bears to acquired knowledge—The hopeful prospect which this opens to mankind.

SECTION IV.—Enquiry concerning the ideal archetype after which education should remodel disproportion—Educational systems compared to sculptors influenced by the commands of their patrons—Comparison of man with quadrupeds—The distinguishing characteristics of man—Definition of the ideal archetype.

SECTION V.—Practical suggestions for Elementary Schools.

SECTION VI.—Practical Suggestions for Central Colleges.



## SECTION I.

INTRODUCTION—The importance of educating taste argued on the ground of material advantages—The question considered from a higher point of view—Particular departments of art and science are more likely to be advanced by the descent of minds of generally cultivated powers, than by a limited special education—Arguments against one-sided education in general.

It may be gathered from the more frequent allusions of the press to the subject of Art Education for the masses, and also from the private discussions of individuals concerning the merits of the various art-manufactures lately exhibited, that "The Exhibition of Industry of all Nations" has awakened the public mind to the importance of schools for the development and education of taste.

There may be some, however, who witnessed the honorable position which British articles of taste maintained in the Crystal Palace who would rest content with the present state of things. We must confess ourselves not of the number, believing as we do that one of the great objects of the Exhibition was to promote a laudable emulation

between individuals and nations, that the powers of man might be the sooner cultivated to their best issues. That English productions should have competed so creditably in matters of taste with those European nations which have possessed the advantages of drawing and modelling schools for many years is truly wonderful, and is a sample of that energy England generally displays on emergencies, but, as on similar occasions, at a greater cost than had she been prepared with a well-organized system to meet them. It ought to be remembered, too, that the Great Industrial Exposition was an extraordinary occasion, and that the English art manufactures there exhibited by no means represented the general tenor of its productions in this class: England has, therefore, yet to obtain a larger body of skilful designers and artisans to maintain this position in the eyes of Europe. This fact in itself sufficiently shews that the organisation of schools for the cultivation of taste imperatively demands earnest attention; how much the more, however, is the necessity urged when we consider that other nations will be stimulated to progress with an already established system of art-education for the people. Austria has perceived the importance of the subject, and her commissioners are forth reconnoitring the establishments of other nations, to gather hints by which to improve her own.

The mercantile value of taste which our governments and merchants have hitherto been so

slow to perceive and acknowledge is daily enforcing more vigorously its claims on their attention; this makes us hopeful for the future; being once moved by the material advantages, they will soon discover its moral influence. We believe till recently that both our legislators and traders blindly followed fashion in these matters: there have been schools of design because other countries had art schools, and there were designers in English manufactories because foreign houses had them; but both the schools and the designers appeared to be respectively considered as bores, and at the same time it was evidently and fervently wished that foreign countries and manufacturers would dispense with such burdensome and unnecessary expenditure. If the proportion of foreign compared with native designers could be statistically arrived at, we believe it would be found that the former greatly predominate. Our own experience tends to this impression,—that England is not yet powerful enough to resist foreign, more especially French, influence in matters of taste; the English are most un-national in this respect, and are content to follow and slavishly obey, instead of endeavouring to establish a groundwork of an original and lasting independence. This un-national weakness is prejudicial in many respects, but chiefly to those men who would be right willing to devote their artistic knowledge to the manufactures, and who see the question from the right point of view, but are

chilled by this fashionable preference for foreign art; they are without honor in their own country, and therefore pursue their usual uncertain vocations rather than quit them for others still more capricious. There is doubtless sufficient latent talent and will in this country to render its art-manufactures pre-eminent, inert only from wanting an enlightened confidence and guidance as prime movers. We hold all the art schools for the people in this country, such as those of design and for drawing and modelling, to be but partially remedial measures, calculated rather to mitigate present exigencies than to eradicate the disease. Schools of design we are heretical enough to consider fundamentally wrong in principle, although first-rate art-talent is enlisted in their service as masters and lecturers: the error lies not here, but in the name and object of a system professing to educate men as designers up to a certain point of art sufficient for this or that particular branch of manufacture. Now if we examine carefully the history of any special section of art or science which has been raised and ennobled, it will invariably be found to have gained this altitude from some mind descending from a higher sphere of action, and imbuing it with an elevating power. It was thus that the great artists of Greece and Italy dignified the minor departments of the arts in their day; examples, too, might be adduced from the history of science. The analyses of familiar things by men of rare genius

have given an interest and life to objects the most unpromising ; such, for instance, were Faraday's lectures on the chemistry of a candle : but would schools, having for their object a limited education in chemistry for particular mercantile purposes, be likely to raise men to advance these purposes ? We think not. The secret of most great improvements has been the descent of minds of large general powers on that which has either been neglected or esteemed unworthy. The principle we are contending for we shall hereafter advocate as one which should be observed in general education ; for, although all men cannot be raised to the height of the illustrious we have referred to, yet we think the proposition will receive assent in the following form,—That in proportion as a man's knowledge exceeds that which is required of him will he be less the slave of his calling.

It must be admitted, however, that Schools of Design are not without their use in so far as they are institutions where, in the practice of drawing and modelling, the larger feeling of art can be obtained ; by making able artists can we alone expect to produce designers fit to be entrusted with the embellishment of the manufactures of this country. There appears, however, to exist a dread lest these institutions should have the effect of creating too many artists, and measures are taken to limit the extent of art-attainment in them to prevent such a result. We believe these limitations to be great

mistakes ; they would be wrong as a consequence of the hypothesis just advanced, that inferior occupations are ennobled by the aid of higher mental attributes. To add to this, we have evidence calculated to allay the fear we have alluded to, in the fact that, although the greater diffusion of knowledge in the present day may have called forth a greater number of authors, at the same time an increased taste for literature required and demanded them. Has not increased education too elevated the status of trade and of the nation generally ?

Artisan schools for drawing and modelling have for some time occupied attention, and are in a great measure calculated to meet future requirements as well as present exigencies,—the present, by elevating the taste of the working men, and for the future that of their children. This system does not profess to make designers otherwise than by inculcating the general principles of art ; the combination of these with their practical knowledge in various trades is left to their own judgment, they being best acquainted with those constructive conditions to which art applied to the manufactures should be subservient.\*

\* This scheme originated with the Committee of the North London School, and was subsequently adopted by the Society of Arts without due acknowledgment. The School was founded with a prevision of those deficiencies in the art-education of the working man which the recent Exhibition has made manifest both to himself and his employer.

The effects of these schools on the present generation of artisans must necessarily be limited, as the few hours they can devote from their brief leisure cannot be of equal value with earlier training during the more pliant period of youth, when impressions are stronger and more indelibly received; nevertheless it is a pleasure to be enabled to bear testimony to the energy, resolute attention, and progress displayed under such apparently untoward circumstances.

We have been considering measures only of partial utility; one important consideration is, however, generally forgotten in questions concerning the elevation of taste, viz. that any scheme to be permanently useful must not only have for its object the rearing of practical artists, but also that of educating the future public theoretically to appreciate their labors. At present there is no reputed system of art-training in the schools and colleges of these realms; it is even worse than disregarded in them, for that which pretends to it is pinched for half-an-hour between Greek and Latin, or made distasteful by drawing on hours of recreation.

There is no short road for the designer or public to arrive at pure taste; it must be acquired by early and systematic training; and why should not the artist and the public perform the first part of their journey together in schools where drawing and modelling should be honorably considered and receive their due proportion of attention? Although

this discourse opened and has hitherto for the most part alluded to taste in its material relations and as a matter of emulation with our foreign neighbours, these are but the grosser aspects of the question, which have been used but as steps to attain a higher position, a more commanding view. We believe æsthetic training to be intimately related with a more enlightened system of education, having for its object the proportional development of the various powers of men. This idea foreshadows in our own mind the regeneration of man physically and morally, the culmination of his power, and, combined with his spiritual hope, the fulfilment of his destiny. To what does the present system of education tend if not to produce deformity by isolating particular faculties and inordinately developing them, whilst others are suffered to degenerate from want of exercise? Physical and mental cripples are its results, warped in form and opinion: it is at once inimical both to beauty and to unanimity. Instead of endeavouring to correct, it increases the organic variations induced by *ante* and *post*-natal influences. The only guiding principle which it is possible to eliminate from its blind routine, is that enforcing the cultivation of the ruling congenital talent; thus what is already immoderate is urged still further into excess; it is this system, we firmly believe, which produces many of those evils in society which are more distinctly seen culminating in opinion, fanaticism, and madness. Does a child manifest a

dominant predilection for any branch of knowledge, the present system pets and encourages this tendency, whilst weaker faculties are left, unheeded, to decay. It is erroneously believed that this is the best method of strengthening and developing natural character and talent; but the faculty thus enlarged we conceive to be analogous to hydrocephalistic development, or the greatness of obesity, which are respectively signs of weakness and inactivity. It is inconsistent, too, with the course pursued in particular educational discipline, where the natural tendency is more evidently immoral; in this case an endeavour is made to check the naturally vicious tendency, encouraging by all possible means opposing qualities till a virtuous equilibrium be produced. Again, in cases of physical disproportion it is the weaker and undeveloped portion of the human frame which the skilful physician endeavours to strengthen; the limb which is naturally strong needs not his aid, neither do over-endowed mental faculties require educational exercise in comparison with the weaker; the former will always be self-helpful: the fear ought rather to be, lest, unchecked, they should tyrannise over the latter. The true policy of education, therefore, would appear to be the establishment of a balance of power between the dominant and subject states of mental organization. One-sided results, the isolation of opinions and pursuits, instead of the unanimity of reason and science, must be the inevitable consequences of an opposite or partial system of

culture. Nature is so linked together in one harmonious whole, that a part can be but imperfectly comprehended unless its relation to the former be also known; yet if we look at the condition of the sciences, how separated, what narrow empiricism, professing to reveal the operations, but only giving a glimpse of nature through a narrow aperture, nevertheless claiming undue consideration and importance, at the same time holding in contempt all but their own limited view; we might point to a similar condition of things in the Arts,—in fact, in all the divisions and subdivisions of the varied pursuits of mankind. If we contemplate our social condition at large, we may witness the elemental powers of a giant strewn around, wanting the connection and bond of life,—all the faculties of the individual man incarnated in huge disunited monstrosities.

Education ought to be considered a plastic art; its aim should be to mould the pliant material of youth to noble proportions, and with Phidian power remodel mankind.

Taking it for granted that all men ought to be educated, and discarding the exoteric and esoteric doctrine as one not to be broached in the present day, notwithstanding the tyranny of untoward circumstances still maintains it, two distinct principles of secular education have been referred to; *first*, that having for its object the partial development of the faculties, and chiefly those congenitally in ex-

cess ; and *secondly*, that opposed to it, aiming to equalise them by advancing those in defect. These systems may be denominated in brief 'the partial' and 'the proportionate.' We have already expressed a belief that the first is fallacious ; it will be the future object of this pamphlet to advocate the second.

In comparing man with the lower animals, it will be found that his distinguishing characteristic is a concentration of qualities, a universality of powers: this at once indicates his proportioned purpose. It is this which gives him regality on the earth, which enables him to scrutinize, judge, and rule mundane affairs, and in the type of a limited infinite dimly reflect omniscience. It was by a similar comparison that the Greek sculptors evolved the human characteristic of the facial angle, observing that, as it advanced towards a right angle, intelligence developed in the same ratio, and that in man the advance was many degrees beyond that of other species of being: they profited by the lesson, caught the intention of nature, and by anticipation hastened her progress.

It is maintained, however, in the face of this characteristic tendency to equality of organization in man, that instead of following this suggestion, and assisting nature towards the goal she is manifestly struggling for, that it is a false doctrine, and not to be desired even if possible, as, if attained, the world would be "stale, flat, and unprofitable." Without

staying to combat the latter part of this assertion, which is believed to be as erroneous as the rest, it is surprising to find these selfsame objectors talk earnestly of progress, which appears paradoxical, for in progress is involved the tendency to equality of powers: is it not so? Look to History:—from man's first departure from the equality of savage life, has he not, in spite of all his conflicts and difficulties, attained to a more equable distribution of physical and moral power? We said equality of savage life, for there may be equality in barbarism; this is the dark valley from which, prompted by indefinite longings, primitive man with eager and unequal strides steps heavenward, often stumbling, but still blindly with outstretched hands rising slowly towards the higher level of day. Although perfection is not involved in equality, equality is in perfection: two watches may keep equally bad time, but we cannot conceive two perfect ones keeping unequal time under similar conditions. The watch, however, has suggested an analogy to the opponents of equable development; it is in vain, say they, to attempt to make men equal, as it is to make two watches go alike. To do so exactly is perhaps impracticable; perfection is humanly unattainable, yet perfection is the polar star which must be steadily kept in view to reach a secure haven. The non-isochronism of watches nevertheless, if examined narrowly, so far from controverting does materially tend to illustrate our argument, for the first watches made

varied considerably more than the chronometers of the present day. What has progress effected in these if not a considerable advance towards equality of character, perfection? Who will gainsay that the best watches, as the best men, differ least? We conclude, therefore, that in progress is involved a tendency towards a more equable development of the human faculties.

It is, therefore, the duty of earnest men to clear as much as lies in their power impediments in the course, that the goal toward which mankind is hastening may the sooner be attained.

## SECTION II.

Organization determines capacity — Capacity in the ratio of organization.

It may perhaps be considered, by those who study these things, supererogatory in the present day to adduce arguments in favor of organization determining capacity ; neither can we do more within the limits of these few pages than scan them : to the many, however, they may not be altogether unnecessary. There is no more fruitful source of error in the formation of schemes having for their professed object the improvement of mankind than that of accepting the schemes themselves as premises instead of conclusions ; or, in other words, testing and deducing their propriety from fundamental and well-established principles. This, it is hoped, will be received as sufficient apology for recapitulating well-known arguments : an additional interest, too, will perhaps be attached to them as links in a chain of reason intended to support the ultimate objects of this essay.

All men compare and combine their sensations

to a certain degree ; but every one is not equally capable of comparing and generalizing them, and forming therefrom ideas and new combinations. All have not the faculty of invention, nay, not even that of perfecting what is already invented. How few are able to think for themselves ; how many others, yet more confined, who cannot think at all, but are ever chained down to imitation, never doing anything but what they have seen done before, nor saying anything but that they have heard said, as if they entirely lacked judgment.

In distinguishing the operations of the mind relatively to their objects, we find that the greater part of mankind are confined to the combination of sensations, very few attaining to that of ideas ; but amongst the small number of those who think, what diversity appears. There are some whose activity of mind is such that they never seize any principle without tracing it to its distant consequences ; there are others, and of these the number is very great, whose less active minds let every consequence escape them which has not a certain degree of evidence, seizing those only which present themselves absolute. There are those, again, whose active minds receive few sensations without comparing them ; these are the ingenious. There are others who compare only certain kinds of sensations ; these have less power than the former, and so much the less so as their minds have a less disposition to compare their sensations and to form

ideas from them. There are many minds so little active, and so greatly averse to thinking, that they neither compare nor combine anything at first sight; they require sensations which are both strong and many times repeated before they are brought to compare them and to form any ideas: such, being more or less stupid, do not differ from the weak-minded but in the small number of their ideas, which they so laboriously produce.

How different likewise the characters of men: in one, judgment is the chief power, in another the imagination; this is fertile in ideas, that other has solidity of judgment; this is more impetuous, superior in argument, that reasons more closely and is more concise; this excites admiration by his lively sallies, that, by the force and solidity of his eloquence, silences, guides, and governs us.

The cause of this wide diversity of minds is attributable to organization, for although most human beings are endowed with the same number of rudimental faculties at birth, (which leads some writers to maintain congenital equality,) these are seldom relatively proportional; this having one predominant, that another, moulded by different antenatal influences. The notion prevalent among educators of developing the dominant faculty tends to perpetuate and aggravate this congenital disproportion, and occasions those numerous varieties, a few of which have been enumerated; whereas the legitimate object of education we hope by-and-

bye to prove, should be to control organization to a more balanced condition.

In contemplating the structure of animals, one cannot fail of being struck with the constant relation which exists between their organization and modes of life, confining them to an isolated and undivided purpose;\* their organic mechanisms are all found admirably adapted to their purposes for strength, swiftness, for flying, running, swimming, for tearing, grasping, climbing, &c. Here is found a grossly developed muscular system designed for main strength; now the arrangements are for springing; one is made for fleetness, another for slow progression. In the timid, the ear is the leading faculty; in the predatory, scent is predominant; in some, the eye is quickened to extreme acuteness: but to enumerate instances would be endless. Works on anatomy and physiology are after all but a few brief commentaries on the constant relation between organization and the power exercised. So familiar indeed have certain characteristics of organization become, and the powers which these confer, that an ordinary observer is enabled to assign with very little difficulty an animal, which he has never before seen, to its proper classification,

\* This is the singleness of purpose, the type, by which the present system of education moulds humanity; if to approximate the brute creation be a worthy object, then, indeed, are men being driven in the right path. The superiority of man consists in a multi-purposed organization.

and to form an approximate estimate of its habits of life. It is this correlation between structure and purpose which enables the anatomist also to interpret the fossil records of a former condition of the earth, and to write the history of extinct species. There are, doubtless, many creatures at the confines of, at that point where the characteristic of one species merges into that of another, the neutral point, the habits of which it would be more difficult to determine. It is perhaps the mixed nature of man which puzzles investigators—which forms the enigma so difficult to solve ; for certain it is, that the relation between his organization and capacity is not in general clearly discerned, or it may be that the individualities and minute variations by which man distinguishes his fellow men, precludes the attainment of that distant point of view which renders the minute differences of other species of being indistinct, and which resolves them into their general characteristics. It has been observed by a talented author, that from such a point of view the fundamental resemblance which lurks below various appearances is often startling.

We must now pursue the subject of organization determining capacity in man, and somewhat further examine the productions of the human mind, the most singular works of imagination, even those which have the least analogy to external nature : all have for their subject sensible objects, or relations of these objects ; almost all our thoughts are corpo-

real images, and of the most abstract ideas there is none which is not fixed by the senses; there is not throughout man's creations a work of the pure intellect. When we desire, for instance, to form any idea of the Deity, or his attributes, he is considered under human relations, at one time as a beneficent Father, at another, as a glorious King; now, as a benevolent Master, then as an offended Judge.

He who would rise to the first of beings and contemplate him in his essence without the aid of corporeal images, perceiving no relation between God and himself, knows not how to form any notion of Him, and is lost in the sublimity of the idea. Thus all religions are supported by a worship which interposes known relations between the Supreme Being and man. One contemplates the Deity in his works, another worships him under an imaginary resemblance; for the heart as well as the mind is ever fixed by the intervention of the senses. Thus, likewise, when we form to ourselves a notion of the soul, we ever represent it as a thin shade or subtle matter; in short, as a corporeal being, if we form any image of it at all. Whatever object we choose, the case is the same; for let us employ our utmost efforts to form ideas wholly intellectual, or to conceive pure spirituality, the only consequence of the attempt is to involve the mind in greater darkness and confusion. Every idea therefore is formed from the true or false relations of sensible objects. The understanding never operates without the con-

currence of the sensations ; in proportion as they are removed from their objects, the ideas we would convey become unintelligible : without their assistance our ideas either escape us, or they are never formed at all.

Let us conclude from the preceding that the sensations are the bases of all our knowledge.

What a variety of minds therefore must be produced by the different structure of the organs of the senses, the only means whereby Man can hold communication with the various beings which surround him. Let it be borne in mind, however, that in speaking of the organs of the senses we include with the external mechanism the cerebral organization connected therewith. Our knowledge is neither increased nor perfected but by comparing our sensations ; the greater number of sensations to be compared, so much the more numerous are our ideas ; the more distinct these sensations, so much the clearer are our conceptions ; and the more exact these comparisons, the more perfect our knowledge must be. On the contrary, the smaller the number of sensations, the more confined is the sphere of mental activity and the less numerous our ideas, not only from the privation of those ideas which are founded on the sensations we are without, but from the privation of many others ; for it is evident, that as all the parts of nature are connected, the sensations of one sense often serve to discover the relations of the sensations of another sense.

The number of our ideas must therefore be relative to the number and structure of these organs. Man must therefore be less intelligent, less ingenious, in proportion as he possesses a smaller number of senses, and as his senses are less perfectly organized.

Although there is an intimate relation between the number of sensations and that of ideas, this relation is not equal with regard to every sense—one sense may be confined, whilst another is less so.

From a calculation of the number of the objects of the senses, the organ of smelling appears to be the most confined, and that of seeing the least so.\* The eye is, of all the bodily organs, the most comprehensive and takes in the greater variety of objects: forms, dimensions, colors, are all within its limits. The varieties it perceives in each of these modifications of matter infinitely surpass all those within the cognizance of the taste, smelling, hearing, and feeling; that is, of sounds, savors, odors, and sensations from the touch. This is evident during sleep, for the many sensations which are retraced in the mind during rest are so many images of visible objects. The sight therefore contributes more to knowledge than any of the other senses.

With regard to the nature of our sensations, it is very evident that from the different structure of the senses in different individuals there must be a great diversity in their respective impressions. The chief

\* Ought it not therefore to receive greater consideration from education? It has been hitherto neglected.

differences between the sensations of different individuals consist in the various degrees of delicacy in organic structure. The more delicate an organ is, the better it perceives those minute objects which escape organs which are less so. The delicacy of the senses is often necessary to the acquisition of many sorts of knowledge. We are indebted to the discovery of the Satellites of Jupiter and other celestial bodies, of the animalculæ in fluids, and of the minutiae of anatomy, to those instruments which have been contrived to supply the imperfection of the senses. It would not, however, be desirable (if possible) that the senses should be heightened to this degree, as a delicate organ is more susceptible of irritation and less distinctly receives strong sensations than another that is less so, and thus loses on one side what it gains on the other. To what end would the faculty of seeing in the dark serve if light were painful to the sight? It is very evident a person so circumstanced would lose by the exchange. With an eye, likewise, which comprehends only a small prospect, we can discover particular beauties more distinctly than with an eye which takes in an extensive circuit, but then the harmony of the whole is not so well perceived. An organ too comprehensive sees detached parts imperfectly; an organ not sufficiently so fails in discerning their relations.

By entering into an examination of the senses which are employed in the several arts and sciences, we shall endeavour hereafter to determine what

particular organization is most desirable, and if desirable, that it is also in a great degree attainable; we may, however, express an opinion for the present that organs moderately delicate, adapted to comprehend a moderate number of objects, and possessed of every faculty in a mean proportional degree, are the most advantageously constructed. In cases where penetration depends on the number and distinctness of the sensations, and on the comparing them together, he whose senses are best constructed must therefore have the greatest natural qualifications.

It may be argued in opposition to this hypothesis, that it is not perceived that persons whose senses are dull, sight imperfect, hearing difficult, and smelling greatly if not wholly decayed, have slower capacities than others.

There is some truth in the observation, if understood of civilized nations, for it is more difficult to perceive the advantage of a superior organization in society where man can easily find means to supply the imperfection of his senses. What defect is there for which art does not afford some remedy? The short-sighted are furnished with glasses; the *weak-sighted* are supplied with other aids which enable them to distinguish such objects as would otherwise escape them. For persons of dull hearing there are acoustic instruments. Supplied with such substitutes, is it strange that men whose senses are imperfect should become in a great measure equal to those who have received from nature more perfect organs?

Take your observations from persons destitute of these resources of art, and then determine.

The very fact of artificial aids extending knowledge shows that it depends upon the perfection of the means existing for obtaining it. It is our belief, however, that such aids never fully compensate deficient natural organization; these are about as relatively serviceable to the senses as an artificial limb to the body. Let us conclude, therefore, that organization determines capacity.

### SECTION III.

External influences modify organization—The difficulty of separating the consideration of organization from that of the conditions essential to its development—The writer has no theory of progressive development in view—Organization most modifiable in the earlier stages of existence—Responsibility of education on this account—Man metes good or evil to society according to the favorable or unfavorable nature of his education—Education the root and stem from which all reform, to be permanent, must branch—Organization may be either degraded or heightened—Education ought, therefore, to take advantage of this modifiability to induce an organization approximating a perfect archetype—The small proportion which intuitive bears to acquired knowledge—The hopeful prospect which this opens to mankind.

IN the preceding section we have briefly attempted to shew the variety and tendency of organization as guiding life into certain spheres of action more or less extensive in proportion to its development. But as active organisms are not placed in a passive world, external influences act upon and modify them in different degrees; so involved, indeed, are the influences of organization upon the external, and inversely external influences on organization, that

we found it difficult to isolate the subject of Section II., nor do we feel sure of having in any measure succeeded: when, however, there are two powers acting and re-acting on each other, it is better to consider the nature of the two forces, first, separately, and, afterwards, unitedly. It was necessary to make a beginning; there was an absolute necessity for commencing with organization,—the living being has its modifying power concentrated; external circumstances are varied and numberless; the all, in fact, but the subtracted personality; it was necessary, therefore, to use the finite as a fulcrum on which argument could operate. Without a given organization on which the external could be considered as acting, a writer must drift to sea on hollow words. We have endeavoured to be thus explicit to correct any notion which priority of treatment might suggest to the reader, that it is conceived to be a natural precedence, or a part of some theory of the progress of creation. Such, however, is not the case, for in putting such a general question into three forms, it would then appear that the worst had been selected; first, organic beings pre-existent to circumstances necessary to their existence; second, organic beings contemporaneous with external circumstances necessary to their existence; third, external circumstances, as pre-existing the beings to which they were essential. This last appears scarcely within the limits of the knowable, and is a subject for speculation; the second is within the range of

man's knowledge ; and the first, self-contradictory ; therefore, had we any creative theory in view, it is not likely that we should have chosen this.

We have hitherto spoken of organization as an isolated subject, and talent as dependent, but we have not yet analysed it to discover what is due to congenital and what to post-natal development.

From the earliest condition of the living being to its end it would appear constantly decreasing in modifiability, infancy and age being the extremes of the scale ; the first half of life being that in which it may be most dominated by, and the latter that in which it most dominates, external conditions. Animals for the most part attain full development in a brief period and are independent sooner after birth ; whereas man, at his first coming into the world, is feeble, helpless, and entirely devoid of knowledge ; he therefore needs strength, assistance, and judgment. Even his senses are not then developed, but supposing they were, he could make no use of them, not having as yet compared his sensations, much less distinguished them ; he perceives no external objects ; in a word, he is an almost insensible automaton, and a scarcely animated statue. The senses gradually unfold : by degrees an infant learns to see and feel, the faculties of the mind afterwards expand with those of the body, and both are fully developed by exercise. The length of time which man requires to attain maturity ought to be esteemed a special privilege conferred by a

beneficent Creator for some great end. Animals are sooner adapted to their limited conditions of being, but man as Wisdom's minister on earth is granted this long state of probation that the divine laws may be instilled while his organization is in that plastic condition most fitted to receive a deep impression of them, that then engraven they may become more indelibly identified with his nature, and thus better prepared to fulfil his high destiny. This privilege, however, is not sufficiently valued and therefore not converted to its best uses; instead of a rational domination of the pliant period of youth, there is a lifeless routine miscalled education.

External forces, as we have said, dominate organization in the earlier stages of being. It is not until the acorn has become a stately tree that it bids defiance to the blast and affords shelter under its branches: the germ may fall on stony ground and rot; take root and flourish a short time in a crevice far too narrow for its maturer demands; competing in soil already thickly pre-occupied for light and air, run up a weak lank stem; or, continuing the category of adverse causes, either springing from under some super-imposed weight, or from being exposed to winds from one quarter, become stunted and warped. Man is no less subject to analogous vicissitudes in the first periods of his existence. During the dependent and impressible ages of childhood and youth, he is oftener the sport of unfavorable circumstances of which his maturity is the

confirmed jest ; but as he approaches the adult state he begins more and more to dominate the outward world, and as it may have meted to him he metes to it again ; if it has been favorable to intellectual growth, he employs himself either in suggesting or advancing schemes for social improvement, or in adding to our material advantages by subjugating sea, river, rock, the elements, and even the subtle electricity to useful ends : if adverse, he undermines the foundations of society, scoffs at order, and suddenly darkens the world with atrocities and crimes.

With these facts before us, what a responsibility is attached to education. Education is the root and trunk of the tree from which all benefits to be permanent must branch. This ought to be constantly borne in mind ; through disregarding the analogous dependence of certain ideas upon certain mental conditions, we see individuals and sects grafting logs in the anomalous and vain expectation that their work will flourish.

Returning more immediately to the subject of external influences, we shall proceed to enumerate some facts regarding the effects of unfavorable circumstances on organization, which will make clearer by antithesis those of opposite conditions hereinafter referred to. We are not of those who regard evil as a permanent necessity, but as the rod of the Divine Master compelling men to learn His true commands,—as the penalty attached to disobedience,

which will ultimately direct them into the paths of immunity and happiness.

In the vegetable kingdom the effects of unfavorable external conditions are very striking; if plants be transferred to an inferior soil and neglected, they gradually degenerate, all their former qualities declining, till they reach that point of retrenchment in organization adapted to their altered and poorer circumstances. In animals a similar effect is produced by scanty sustenance and removal from the watchful care of man. Look, for instance, at the diminutive race of cattle feeding on the scanty herbage of the desolate moors of the north, or again at those diseased by his cruelty or folly, stimulated to their utmost powers, now strained with tottering limbs, now battered into helplessness. These are conditions of deficiency and excess which are alike prejudicial to living beings by diverting organization from *that perfect central condition in which well-being consists*. Nor is man exempted by the all-wise Ruler from the penalties attached to the infringement of this great law. It is no mere analogy; the same relative conditions produce the same relative effects in him as those beings lower in the scale of creation, as may be daily witnessed around us.

“About two hundred years ago a number of people were driven by a barbarous policy from the counties of Antrim and Down, in Ireland, towards the sea-coast, where they have ever since been

settled, but in unusually miserable circumstances even for Ireland, and the consequence is that they exhibit peculiar features of the most repulsive kind, projecting jaws, with large open mouths, depressed noses, high cheek bones, and bow legs, together with an extremely diminutive stature. These, with an abnormal slenderness of the limbs, are the outward marks of a low and barbarous condition all over the world; it is particularly seen in the Australian aborigines." "Coarse, unwholesome, and ill-prepared food," says Buffon, "makes the human race degenerate; all those people who live miserably are ugly and ill made." Mental degeneracy too is its accompaniment; those powers which rightly directed constitute the dignity of man fall away, and instead of bequeathing a noble history to posterity encumber it with chronicles of crime; without the compass of reason man is left a wreck in a sea of passion. Look at the criminal statistics, and for the tens who dishonor education there are thousands who claim the pity due to ignorance and poverty. We know we are only reiterating but feebly what others have, and are now crying aloud; we only contribute to the gradually gathering utterances which must ultimately thunder an irresistible appeal for a more extended and enlightened system of education.

How numerous are the deformities occasioned by unfavorable circumstances in organization! Look at that terrible form of humanity, cretinism, the causes of which have been discovered to be at-

mospheric and other peculiar conditions of the valleys in mountainous districts,—in short, endemic—this is a marked instance; or, again, at those produced by certain one-sided mental or physical occupations, crippling both mind and body, which eventually become ancylosed, like those of the Hindoo votaries who vow an eternal position. Society has its martyrs as well as Vishnu; there is, however, this difference; with the latter it is a willing, with the former a compulsory sacrifice.

Having briefly scanned those conditions which depress, we shall proceed to the consideration of such as have an opposite tendency, or that of raising organization; for *in the knowledge of those causes which either increase or decrease the faculties, consists the power we maintain education should exert to modify congenital nature with reference to an ideal archetype.*

Infinitely more scientific attention has been bestowed on the development of vegetable and animal structures than that of man; especially of those which are more immediately necessary or useful. In agriculture, for instance, the largest yield of grain from the smallest space being the desideratum stimulated scientific men to seek those external conditions most conducive to the result required, and it is well known how successfully this research has been prosecuted. Over those animals, too, which have been domesticated for various purposes, what dominion has not experience given, enabling man

not only to produce a general development of this or that particular species, but also a particular organization of the species. As in the horse for strength, general purposes, or swiftness. In the ox, the long-horned, short-horned, white-faced, &c. In sheep, the short-legged, long-legged, black faced, &c. The agriculturist and the breeder of cattle know by experience that such and such given conditions produce certain results, and thus, though perhaps unconsciously, tend to confirm the proposition that organization may be controlled to a purpose. If we turn to the consideration of man, instances are of easy enumeration which clearly show to what extent organization may be urged, and that any particular manifestation may be more or less induced by exercise proportionately to the favorable or unfavorable predisposition of innate structural condition. In various mechanical pursuits what dexterity is gained by constant practice; in performing on musical instruments what rapid and complex movements of the fingers; in professional dancers and athletæ, what strength and flexibility of limb; in the prize-fighter, what muscular development; in the blind, what an abnormal sense of touch. Yet all these result from continued voluntary or necessitated gradual exercise. It is no less the case with the mental faculties; it is ever exercise which developes and strengthens.

Of what little service are congenital compared with acquired powers, even in those whose talents

are attributed to great natural genius. Let the mathematician, with his logical subtlety of discrimination, compare his present powers with those he had at fourteen, or the great artist his ability of delineating forms with that possessed at the same age. What were Sir Isaac Newton and Michael Angelo at this period of their career? What was the amount of their innate compared with their achieved greatness?

When treating of the conditions which debase organization, we alluded to the discovery that the atmospherical and other phenomena peculiar to the valleys of mountainous districts were the causes of cretinism; an establishment was therefore founded beyond such influences, to which those afflicted were removed as early as possible. The results were most favorable, and in this extreme case it has been proved that the controlling and compelling of organization towards a higher type is not, as it was deemed, hopeless—science in this as in other cases subjugating evil.

All the preceding instances, we think, incontrovertibly shew that a second nature may be superinduced on the congenital. This will, perhaps, readily meet with an assent: it is assented to in an often used aphoristic expression, "use is second nature;" but like many other isolated inductive generalizations, which have accumulated in the storehouse of experience, still awaits the deductions of science to be converted to useful purposes. We

desire to see man's second nature developed under the guidance of Science and Reason.

How hopeful is the doctrine of acquired compared with the fatal one of innate talent. Let those who are weak believe they may become stronger; let every one doubt the efficacy of inherent genius, for they who remain passive in the full confidence of possessing it, may live to hear the achieved talent of others acknowledged and their own disallowed.

Without cultivation he who has received from nature the most perfect, has no advantage over him who has received an inferior organization; but supposing them to be animated by an equal energy of application to study, their efforts would be attended with very different success. Whilst the former would surmount without difficulty the greatest obstacles and advance with a rapid flight towards truth, easily penetrating the relations of phenomena, the attempts of the latter would be obstructed by natural impediments, and his progress slower in the vast career of science. But those who have received from nature a high degree of organic sensibility and those who are inferiorly endowed, seldom possess an equal tendency to cultivate them; those having acute natural perceptions have not the same urgent motives to application as those who are inferior in this respect,—the former is apt to lull into inactivity, whilst the latter stimulates to enquiry and research.

Whether human nature is capable of illimitable progress, or whether a point is fixed beyond which it can never pass, is a matter for speculation ; but if debased organization, from various causes, is perpetuated in our species, may not also improved organic structure be continued and advanced in posterity ? If this latter should prove to be the fact, how sublime the prospect of the future : who could indolently disregard the subject of education ?

The aim of this section of our enquiry has been to show the modifiability of organization. Our next step will be to suggest the purpose to which education should convert this quality.

## SECTION IV.

Enquiry concerning the ideal archetype after which education should remodel disproportion—Educational systems compared to sculptors influenced by the commands of their patrons—Comparison of man with quadrupeds—The distinguishing characteristics of man—Definition of the ideal archetype.

Our arguments at present rest in the following form:—organization determines capacity—external circumstances influence and modify organization. Organization is heightened or debased by opposite conditions; many of these conditions known, and may be controlled. This invests education with a power by which it may mould organization, *cæteris paribus*, capacity. Education may therefore be considered as a plastic art, and its various systems as so many sculptors hewing humanity according to the caprice, ignorance, or wisdom of their lords. One patron may know the beautiful, but desire the sculptor to render corrupt forms; another command with the capriciousness of ignorance; or a third in wisdom desire the work after an ideal standard; according to the motive, deserving either the contempt, pity, or admiration of sensible men.

We know this essay not to be intentionally false, whatever errors may have crept in under the shadow of ignorance; therefore, with the certainty of sincerity and firm belief in the principles advocated, we shall now endeavour to establish the archetype to which education should mould mankind. To arrive at this, we shall compare the human powers with other species of beings.

If the structures of animals, birds, reptiles, &c. be considered in their combinations of bones, muscles, and nerves, they will be found to possess a greater disparity of power than man: that is to say, in the former, particular powers are advanced at the expense of others for special purposes. Nature holds, as it were, a scale of opposite advantages; when she bestows a preponderance on one side, it is in the duplicate ratio of that subtracted from the other. If she confers some favors too liberally, she at the same time denies others. In man alone does she endeavour to mete them equally.

The variations between the relative organic developments of different powers in the same being lie between the two extremes of equality and greatest difference. We hope to show that the organs of man most approach the former, other beings in different degrees the latter relation.

No one can look into the museum of his memory without being struck with numerous instances of creatures strangely formed; but if to this first impression the history of the habits of each be called

to mind and compared with its structure, the consciousness of perfect adaptation as the material revelation of Divine Wisdom overcomes all other feelings, even that natural repugnance to forms of being widely differing from us.

The lower orders of creation are confined to one routine ; the history of a day is the history of a life ; like human mechanical inventions, destined to fulfil one special purpose and no other. Whereas man, superadded to his daily wants, has a mental nature capable of indefinite improvement. It is not to-day as it was in ages past ; its history is yet incomplete and purpose unfilled, ever expanding with fresh experience to encounter the sphere of the knowable. In this tendency to sphericity is involved also that to equality of power in all directions, contradistinguishing him from creatures of mere instinct which continually move in a plane.

What disparity in the organization of other animated creatures compared with man, whose representative component elements may be found in them extended and exaggerated in particular directions, showing that *in the ratio that any special function is urged to an extreme, is it accompanied with inferiority in general power.* The ascending tendency in being is towards centralization ; in this respect the higher animals will be found superior to those below them ; but still greatly inferior to man. Centralization of power constitutes, in fact, superiority in animated nature, as in art, it is the ideal of

the philosopher, poet, painter, sculptor, and mechanician : it is the *ne plus ultra* of man's conception of the universe.

As there is an obvious analogy between the human form and that of an ordinary mammalian quadruped, by comparing sections of the structure of the former with their representatives in the latter, the characteristics of special and general adaptation will be at once illustrated.

The head. The facial section of animals is more protuberant and excessive compared with that receptive of the brain ; the jaws longer, the immediate organization of the senses larger. In man the facial angle is raised towards the point of angular indifference between the acute and obtuse ; the senses are retracted and more equal in their divisions ; the Greeks discovered this tendency and realized this in the ideal proportions of their sculpture ; the nervous organization of the eye, ear, and nose, by this retraction are brought into more central cerebral relations ; his senses are less independently perceptive than in animals. The first impressions of seeing, hearing, and smelling in the latter are more acute, more instinctive ; those of man require the corrections of experience and judgment ; their proximity to a nervous centre excites comparison and reason, and thus a special inferiority is counterbalanced by increased cerebral capacity. It is this very deficiency of intuition in man which constitutes his greatness ; if it had been otherwise, he would have had no

incitement either to acquire knowledge, preserve or communicate it. But if some of the senses are more acute in animals, others are less so ; the inequality between the organs of seeing, hearing, and smelling, becomes greater as they descend in the scale ; even in the mammalia this disparity is very evident ; sometimes in an over adequacy for general but not particular purposes, at others below the centre of the scale of power not being required. In the feline race the eye is adapted for vision in a subdued light ; the glare of day is consequently irritating and painful to them ; their scent is also keen, both of which suit them for prowling and predatory habits. But if the organs of vision are dominant and peculiarly extended in one line of direction in the carnivora, those of hearing and seeing have also extreme and peculiar modifications in the herbivorous tribes : as the ferocious are led by scent, the timid are warned by the ear ; the sight of the former is fitted for night, that of the latter for extended vision by day. Thus in the order of things a balance of chances between escape and destruction is instituted.

The neck and trunk. The cervical vertebræ are found to be extra-developed lengthwise in the giraffe, camel, stag, horse, &c., whereas in the hog, elephant, hippopotamus, and others, these are extremely retracted : the number is the same, but longer or shorter in proportion than man. The trunk too in quadrupeds occupies a larger proportion of the whole frame than in the human subject.

The limbs. The metacarpal and metatarsal bones are lengthened into stilts for swiftness in the digitigrade, as the horse, deer, and many other quadrupeds; while in the plantigrade, such as the bear, sloth, &c., the bones and the phalanges become extremely developed as paws. The range of movement of the limbs of both these divisions is chiefly confined to one plane, whereas those of man are more capable of movement in every direction; his arm can move through the greater portion of a sphere: even his lower limbs, which are naturally more confined, have much greater power of rotation than the corresponding members in the former, and by exercise these may attain a range almost as extensive as that of the arms. The disposition of his muscles also is more even than in quadrupeds, the bones of which are sometimes almost denuded, at others thickly enveloped.

But if the mammalian quadrupeds exhibit disparity of organization when compared with man, how much more do those still lower in the scale, thinking, however, that if the fact were manifest in those instances where it was less likely to be perceptible, it would be more satisfactory than illustrating with extreme instances. It is hoped, however, that those which have been made will have sufficiently confirmed the position previously assumed—that man's pre-eminence in the scale of being is physically dependent on a greater equality in the subdivisions of his frame, in the power of moving

his limbs in different directions, and in the susceptibility of his senses. His head was found to be more equally divided between the face and cavity of the brain, the joints of his limbs central, and in his variations of proportion approximating mean rather than extreme differences, his limbs possessing, though less extended in their motion in some one particular direction, a moderate degree through the larger portion of a sphere. In the constitution of his senses, if his eye be not so far-sighted as the eagle, his scent not so keen as the lion, nor hearing sensitive as that of the hare; neither is he deficient in these qualities, but has them equally developed in a mean proportional degree.

The more we interrogate Nature the more imperatively does she point to equality of organization as her ideal; consequently the further man departs from this standard, the nearer must he necessarily approximate the characteristic of brutes' disparity of powers.

There would appear, then, to be two extreme tendencies in the combination of powers in living beings; the one towards greatest difference, the other towards equality: the former is the descending, the latter the ascending scale. Extreme difference is represented by the lowest conditions of living things, and man culminates in equality.

That man should at one time be considered as a synthesis of mean powers, and at another as the dominant extreme of animated nature, may at first

seem paradoxical ; but if carefully considered, their co-existence will not be found incompatible. Man is the *extreme* aggregation of moderate organization ; other beings are extreme by inordinate special development. Our meaning will perhaps be better understood in the following axioms :—

1st. Beings in which particular organs are over-endowed are inferior, their end limited.

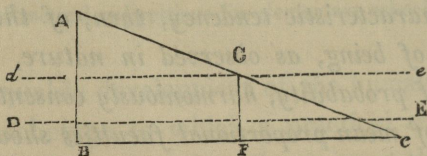
2nd. Beings in which the greatest number of organs are concentrated in the equality of their mean\* proportional development are superior, more universal in their purpose.

If an equable organization be the characteristic towards which man is tending, we should expect to find this equality reflected in those operations by which he reconciles the external world to himself ; and such is the case. To diminish extreme distances, to level mountains, to straighten the course of rivers, to counteract the winds and waves, and to equalize the irregularities of temperature,

\* Some misapprehension may arise should the words “ mean ” and “ mediocrity ” be considered equivalent. “ Mean ” is here used in a mathematical sense ; “ mediocrity ” is usually applied to half-way talent. According to our own views there are two mediocrities-- the feeble and the impudent ; the former is entirely below the perfect mean, the latter “ o’ersteps the modesty of Nature ” in some particular, and explodes in excess—bombast, eccentricity, and egotism. This is too often mistaken in the present day for true talent.

are only a few of the instances in which he manifests a natural tendency to surround himself with an equality of mean conditions: in this light he may be contemplated as a moderator of the extremes of outward phenomena.

If it were permissible to speculate further we might imagine a correlation existing between man's progress and that of the earth towards that equilibrium which has been predicted—the coincidence of the planes of the equator and ecliptic.



Let  $A B C$  be a rectilinear triangle, suppose a right line,  $D E$ , to move parallel to  $B C$ , cutting  $B A$  and  $C A$  through their whole extent. Then if right lines be drawn to  $B C$  from every point of intersection of  $D E$  and  $A C$  parallel to  $A B$ , the series from  $C$  to  $A$  would represent all abstract quantitative relations, and therefore of those possible between any two magnitudes. Let the right line  $D E$  be in the position  $d e$  in its parallel progress, where it divides  $A B$  equally and consequently  $A C$  also equally in  $G$ , therefore a light line drawn from  $G$  parallel to  $A B$  and touching  $B C$  in  $F$  would represent the mean or average of the series. It is also the mean relation of the series to  $A B$ , there-

fore the average difference between two magnitudes is as  $G F : A B$ , or  $1 : 2$ .\*

Let the series from  $C$  to  $A$  represent all the degrees of developement of any particular organ in man, the right line  $A B$  being its greatest and the point  $C$  its least manifestation, then, according to the law of probability,  $G F$  would be the best proportion, as all above  $G F$  might be too great and all below it too little. Let this principle be applied to all his faculties, and an equality of mean powers is the best probable arrangement of his nature.†

*The characteristic tendency, then, of the ascending scale of being, as observed in nature, and also the law of probability, harmoniously consent that the equality of mean proportional faculties should be the archetypal standard which should guide the plastic powers of education in the reformation of humanity.*

\* This leads the writer to announce "The Calculus of Æsthetics; or, Metre of Human Powers," a work which has for some years been in progress, and the completion of which is still protracted by the demands of a special profession on his time.

In this he hopes to establish a mathematical science of self knowledge, the beautiful and the good in harmony with experience, which will bring these subjects under the dominion of measure and number and category of the exact sciences. He believes that the calculus used above is a key which will eventually unlock many mysteries: one which immediately occurs to him is that of the philosophy of ancient Greece. All mental and physical phenomena may be quantified by it.

† Perhaps this law of average is a mental principle necessitated by a middle nature, and would lead to the supposition that man approximates the average of being. That a being so constituted should average appears consistent.

## SECTION V.

## Practical suggestions for elementary schools.

IF an equable development of the human faculties be the archetype to which a practical educational system should conform in order to exert the greatest amount of beneficial influence on the destiny of man, its arrangements for instruction should be equably planned; to effect this, it will be necessary to retrench the excesses of existing systems, and at the same time advance neglected departments of culture to their due measure. Nature appeals to the senses in her first instructions; the first alphabet conneed is composed of the symbols of objective existence. To develop the senses to their perfect use should therefore be one of the first objects of an educational system. During the transitive period of civilization, it was natural that men should regard the antique world with an undue veneration, and mistake the beacon for the haven; the higher

faculties of independent thought and action were therefore allowed to lie dormant. In this epoch, it was believed that every perfection had been attained by the ancients in art, literature, and philosophy ; and that a man need only to consult Greek and Latin to find everything he mentally required inscribed on the sepulchres of the past ; but now that a new light is seen dawning from the opposite horizon, we may fearlessly interrogate nature concerning a more practical and efficient system of instruction. The first object, then, of an elementary course of training should be *the development of the faculties in their simplest and most comprehensive masses* in all the essentials requisite to a perfect man, that when called to a special profession, he may not be its slave, but its lord. Look at the students in any special branch of study. You may see by their demeanour they believe themselves to be the observed of all observers, the partizans of the only science deserving public consideration ; proud of their menial badge, insulting common sense, proud of a servile dignity, instead of honoring their profession by a noble modesty. Such a feeling, we think, would not exist if education from the eminence of a higher philosophy were to open a comprehensive prospect of the enchainment of phenomena from whence nature might be contemplated in its solemn grandeur.

The most important subjects of elementary training are the following :—

1. THE BODY
2. THE SENSES.
3. THE REASONING FACULTY.
4. THE MORAL SENTIMENTS.
5. THE NATIONAL LANGUAGE.

### 1. THE BODY.

The body should be maintained in a healthy condition as a bank of strength from whence the intellect may draw its supply of nervous energy. If the body fails, wit is bankrupt; the importance of muscular exercise is generally admitted, but seldom particularly attended to. The outermost circle of the plan\* is allotted to the gymnasium.

### 2. THE SENSES.

#### *The education of the eye.*

The perfection of this sense depends on the accurate perception of the relations of colors, configuration and position, qualities as requisite in the scientific observer as the artist. The most complete training of this organ, however, has hitherto been confined to painters and sculptors; it ought to receive a more important consideration in the scheme of education. In our plan, therefore, drawing, modelling, and painting, as exercises for the eye will be found provided for.

#### *The education of the ear.*

The perfection of the sense of hearing depends on

\* Vide Lithographic Plan No. 1.

the exactitude with which it measures duration and the relative value of sounds. Musical exercises are the most calculated to develop this organ; the influence of music in elevating taste has not been sufficiently estimated in this country. As a source of rational enjoyment, too, it deserves a proportionate share of attention in educational arrangements.

*The sense of touch and the hand.*

The sense should estimate surface and force with precision. The perfection of the hand consists in using these qualities with manipulative dexterity. The development of the sense of touch and facility of hand are best promoted by the practice of drawing, modelling, and instrumental music.\* No separate department of culture is therefore needed, the training of these being included in the preceding arrangements.

*The senses of taste and smell.*

These appertain to the more immediate functions of life, and are maintained in due proportion by the proper culture of the rest. It may here be remarked that the greater the number of the faculties brought into equable training, the less is it possible for the remaining senses to exist in disproportion.

\* The practice of art induces a skill of hand superior to any other employment. Painters and sculptors are generally dexterous in those mechanical occupations which they pursue for amusement.

### 3. THE REASONING FACULTY.

This is the judicial and guiding faculty of man ; therefore is its cultivation of the highest importance. That it may be developed to its perfect use, the central class room is allotted to mathematical studies : these by producing precision of thought contribute in a great measure to rectitude of action.

### 4. THE MORAL SENTIMENTS.

It is needless to say the cultivation of these in a responsible being is highly essential. Readings in history, biography, and poetry, judiciously chosen, might be made instrumental as accessorial to religious instruction in forming noble and virtuous principles, especially by showing that depraved morals have not only caused the downfall of individuals but of states. It will be seen that the system now under discussion has a direct moral tendency, as the equable cultivation of the faculties must decrease the possibility of an undue preponderance in the animal propensities.

### 5. THE NATIONAL LANGUAGE.

Language has resulted from the combination of powers in man. It is language which gives him a progressive advantage : without it individual experience would be lost and science impossible ; without it every age would start from exactly the same point as the preceding. By its means knowledge is accu-

mulated and transferred ; men are thus enabled to avoid the failures and profit by the experience of their predecessors and contemporaries, the more completely so as the symbols used may have had definite significations. The inculcation of an exact nomenclature would be a worthy subject of instruction, and one which might be superadded to grammatical exercises with advantage.

To the school-room of each of the departments of study enumerated it is proposed to attach a lecture-room and library ; the former for the delivery of theoretical principles, the latter for books relating to the particular subject of instruction.

No scheme of education could be devised to meet every condition of organization ; the one proposed, however, is not calculated to increase congenital disproportion. In special cases the judgment of the presiding master should determine which studies should be most and which least insisted on, *the principle being in every case the bestowal of the greatest attention on the weaker faculties.*

We have now gone through the course of training proposed for elementary schools. Some trifling additions would, perhaps, be required in practice, but it was thought better not to encumber this nucleus of an educational system with any accessories which might interfere with its unity. It is believed that no consideration has been neglected essential towards the development of perfect manhood. In the plan for central colleges to be pre-

sently proposed, the system will be found enlarged to meet most special practical requirements.

It may be remembered that in the commencement of this essay we broached an opinion that education in taste was intimately connected with a more enlarged view of public instruction; the considerations which led to this opinion have now been stated. Whether a more enlarged view has been suggested, it is for others to decide. Another position assumed was that a healthful progression in matters of taste required a public to appreciate as well as artists to design. The system proposed would have the tendency to fulfil these conditions; we hope, in fact, to have shewn that an æsthetic training is the proper preparative for all special professions.

## SECTION VI.

## Practical suggestions for central colleges.

IN the annexed plan the elementary nucleus recently proposed will be found expanded to meet all the requirements of particular professions. Pure mathematics occupy its centre, the application of these to theoretical science next succeeds, experimental philosophy occupies the middle zone. Science applied to the useful arts is the next division, each section terminating in a library and museum, the whole surrounded by a gymnasium. The lithographed plan No. 2 will exhibit the scheme of a central college at one view, and far better than any written description.\*

We have endeavoured in its design to preserve a natural connection between the various departments of science, in order to constitute a consistent unity. The Crystal Palace might be adapted to such a scheme: in the conversion, however, it

The Plans represent merely the relative arrangement of lecture-rooms, &c., without reference to architectural or structural proportions.

would necessarily lose the beauty of its original fitness ; whereas, if the funds required for its purchase were to be applied to the erection of a crystal college, the public would in all probability have a building better adapted to the purpose.

In such a college the highest talent, foreign as well as native, in every section of science should be concentrated.\* England would then become the centre of the intellectual world, and thus attain the culmination of her power.

\* An association of the members of each art or trade should appoint a paid scientific representative in correspondence with the college, to investigate either the mechanical or chemical processes involved in its practice. General science, art, and manufacture would thus reciprocate advantages. Scholarships should be open to students, who might distinguish themselves in every department of training belonging to the elementary schools.

THE END.

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AND PRINTED BY J. JOHNSON, ST. PAUL'S CHURCH-YARD, LONDON.